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AUTHOR Sherrill, Claudine; Kelly, Luke
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ABSTRACT

A comparative study was made of mentally retarded and nonhandicapped children in the first through third grades on motor performance as measured by running (50-yard dash), jumping (standing broad jump), and throwing (softball throw for distance). The subjects had received all of their physical education instruction in a mainstream setting since entrance into the first grade. Results revealed that, on each skill, significant differences were found between sexes, favoring the boys, and between grades, showing expected developmental trends. There was no significant difference between the handicapped and nonhandicapped subjects on the standing broad jump and the 50-yard dash. There was, however, a significant difference between conditions on the softball throw. The nonhandicapped boys performed best, then the handicapped boys, followed by the nonhandicapped girls, and the handicapped girls. (JD)

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MOTOR PERFORMANCE OF PRIMARY AGE HANDICAPPED AND NONHANDICAPPED CHILDREN IN THE MAINSTREAM: A COMPARISON

Claudine Sherrill and Luke Kelly
Texas Woman's University

While many authorities support the widespread practice of mainstreaming normal and handicapped children for instruction in physical education, little motor development research exists to document the efficacy of such placement. The major criteria for assigning handicapped children to regular rather than adapted physical education appear to be their assumed similarity to normal children in motor performance and their ability to benefit from mainstream instruction. The first of these criteria, based upon the assumption of no significant differences in motor performance, is not supported by most investigators (Francis & Rarick, 1959; Howe, 1959; Malpass, 1960; Senstock, 1966; Rarick, Widdop, & Broadhead, 1970; Bruininks & Bruininks, 1977).

The finding that mildly mentally retarded children are 2 to 4 years behind their normal peers on measures of motor performance (Francis & Rarick, 1959) is still widely accepted. It is not known, however, whether this motor discrepancy is the result of inequitable instruction and experience or a reflection of limited capabilities. The classic studies comparing handicapped and nonhandicapped subjects were all conducted in non-mainstream settings with no controls for dissimilarity in instruction and practice. Research is needed to determine if handicapped children provided with instruction since the beginning of their schooling are motorically inferior to their nonhandicapped peers.

The ability of handicapped students to benefit from mainstream physical education instruction has been subjected to even less research than the first criterion (Stein, 1966; Adams, 1971). A comprehensive review of research on

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mainstreaming mentally retarded children by Corman & Gottlieb (1978) includes no studies of motor performance among its more than 40 entries. Stein's research (1966) entailed the administration of the AAHPER Youth Fitness Test and the Cowell Personal Distance Scale to 187 boys in six mainstream physical education classes before and after 8-months of instruction. Only 24 of the subjects were retarded; the others were placed into four IQ groups for statistical comparisons. Stein found that the retarded boys differed significantly from the other IQ groups on both pre and post-tests for only the shuttle run. He concluded, "It appeared that these mentally retarded subjects were able to compete satisfactorily with their classmates in physical education when level of physical fitness was used as the criterion" (p. 240). With regard to sociometric status, however, Stein reported that the mentally retarded was the most rejected group on both pre and post-tests. The results indicated that "they had become further isolated socially and had lost in acceptance significantly more than the other IQ groups over the 8-months experimental period" (p. 242). Interpretation of Stein's findings as support for mainstreaming must therefore be approached with caution. The critical factor appears to be the long range physical education goals on the individualized education program (IEP) of the handicapped child.

Adams' (1971) findings were similar to those of Stein. Three groups comprised of 10, 11, and 20 educable mentally retarded junior high girls were organized as adapted, mainstream, and control instructional settings. At the end of one semester Adams concluded that "social adjustment (as assessed through teachers' rating and peer acceptance) among EMR girls appears to be better achieved through participation in an adapted physical education program rather than through retention in regular physical education classes" (p. 165). It was also indicated that the regular and the adapted programs appeared to be equally effective in promoting motor development.

Orfitelli (1978) presented a strong rationale for initiating descriptive-comparative research concerning the motor performance of various groups now commonly found in mainstream physical education. The findings of his research (1977), however, largely paralleled those of Rarick and earlier investigators. Normal children, ages 6 to 9 yrs., were significantly better than learning disabled and mentally retarded children in the mainstream on seven of nine motor tasks.

Our pilot study (Lindman, 1979) appears to be the only investigation other than those of Stein and Adams in which no significant differences are found between handicapped and nonhandicapped students. The 50-yard dash, standing broad jump, and softball throw for distance were administered to 73 handicapped and 132 nonhandicapped children in grades 1-3, from two schools in Richardson, Texas. The findings revealed no significant differences between handicapped and nonhandicapped on the standing broad jump and the softball throw for distance. There was, however, a significant difference at the .01 level on the 50-yard dash which favored the handicapped. These results are in conflict with the existing body of research literature which is based on data collected from subjects in non-mainstream settings. The need to replicate the Lindman study with several teachers in several different school systems led to the present investigation.

Purpose of the Study

The purpose of this study was to compare handicapped (n=290) and non-handicapped (n=990) children in grades one to three on motor performance as measured by running (50-yard dash), jumping (standing broad jump), and throwing (softball throw for distance). All subjects had received all of their physical education instruction in a mainstream setting since entrance into the first grade. It was hypothesized that there would be no significant differences between handicapped and nonhandicapped in any of the three skills.

Method

Data were collected from children in mainstream physical education settings in four school districts in Texas: Richardson (n=205), Irving (n=731), Dallas (n=32), and Alief (n=312). Table 1 shows the breakdown of handicapped and nonhandicapped subjects by sex and grade. The handicapped group was comprised of 62% boys and 38% girls while the nonhandicapped group included 52% boys and 48% girls.

Of the 1280 subjects, 23% were handicapped, i.e. receiving special education services. Of these children, 80% were learning disabled; 7% were educable mentally retarded; 5% were emotionally disturbed; 5% were other health impaired; and 1% each came from trainable mentally retarded, orthopedically impaired, and hearing impaired categories.

The intraclass correlation technique was used to determine reliability over 10 trials for each skill for handicapped and nonhandicapped children by sex and grade level. The reliability coefficients for all groups (n=30) on all skills over the 10 trials ranged from .94 to .99. Thereafter the best of three trials was used as the score.

A three-way analysis of variance was computed to determine significant differences between groups on sex, age, and handicapping condition. Logarithmic transformations were necessary for the analysis of variance because of the large difference in the sizes of the groups; homogeneity of variance was thus established. The Scheffé Post Hoc Test for comparison between means was applied.

Results

Table 2 indicates that on each skill significant differences were found between sexes, favoring the boys, and between grades, showing expected developmental trends. There was no significant difference between the handicapped and normal subjects on the standing broad jump and the 50-yard-dash.

There was, however, a significant difference between conditions on the softball throw. The normal boys performed best, then the handicapped boys, followed by the normal girls, and the handicapped girls.

Discussion

Texas passed state legislation comparable to PL 94-142 in 1969 and thus became one of the first states to mainstream its handicapped children. Physical educators in Texas have been led to believe that they were serving virtually 85% of all handicapped children in their regular classes. It was assumed therefore that the sample of mainstream handicapped students from four school districts would include a high percentage of educable mentally retarded and that findings of the study could be compared with those in the related literature. This assumption was not correct since 80% of the 390 handicapped children were learning disabled. Almost no research on the motor performance of this group exists, and Rarick's finding that mentally retarded children are 2-4 years behind their peers obviously cannot be generalized to learning disabled children.

The most closely related published literature to the present study thus was Bruininks & Bruinink's (1977) comparison of 55 learning disabled and 55 nondisabled students. Both samples included 38 boys and 17 girls ranging in age from 6 to 13 years with a mean age of 9 yrs., 3 mo. The instrument used was the Bruininks-Oseretsky Test of Motor Proficiency. The researchers reported that learning disabled students were significantly lower than non-disabled students in over-all motor performance with their most deficient areas being balance skills, simultaneous or sequential bilateral coordination of movements involving arms and legs, and visual-motor coordination required in drawing designs and tracing mazes.

The other related study (Orfitelli, 1977) compared 26 learning disabled children, ages 6 to 9 years, with 36 normal children, 26 educable mentally

retarded, and 15 trainable mentally retarded. Although nine motor tasks were used, none was the same as those in the present investigation. Orfitelli reported that the motor performance of the learning disabled children was significantly lower than that of the normal on all items except reaction time and movement time.

The present study appears to be valuable primarily for its insight into the motor performance of a large sample of young learning disabled children. No other research has been reported which describes the performance of learning disabled children on the 50-yard-dash, the standing broad jump, and the overarm softball throw. The recommended next procedure is to eliminate all subjects except the learning disabled from the handicapped sample and recalculate the statistics.

Table 1 - Description of 1280 Subjects by grade, sex, and condition:

Grade	Handicapped		Nonhandicapped	
	Boys	Girls	Boys	Girls
First	49	30	166	148
Second	81	34	184	167
Third	52	44	163	162
Total	182	108	513	477

Table 2 - Comparisons by sex, condition, and grade:

Source	df	Broad Jump F	50-Yard Dash F	Softball Throw F
Main Effects				
Sex	1	71.057*	11.020*	940.143*
Condition	1	2.586	4.098	43.563*
Grade	2	148.219*	15.144*	324.978*
Two-way Interactions				
Sex/Condition	1	.700	.492	6.379
Sex/Grade	2	2.859	.229	24.602*
Condition/Grade	2	.741	1.557	.706
Three-way Interactions				
Sex/Grade/ Condition	2	4.018	.384	1.275
Explained		34.073*		
Residual	1268			
Total	1279			

* .01

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